Incidence of foreign bodies in quaternary hospital patients

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Abstract

Foreign bodies in the ENT area are very common, in our experience, in low-income countries, for several reasons, including a lack of appropriate and suitable toys for children. The study aims to determine the epidemiological and clinical profile of patients assisted in the ENT Service with an initial diagnosis of FB, during the period 2007-2011. A descriptive, retrospective study, which goes through a collection and analysis of the data available in several registry books of patients with foreign bodies consecutively in 5 years. Results: In this study, it was observed a total of 2615 patients with foreign bodies. Most cases occur from August to November. At the end of the week, fewer cases were observed. Most of the patients were male. The most frequent complaint of patients with foreign bodies in this study was dysphagia. Metals were the most found foreign bodies and most of them were found in the esophagus. This study presents a compilation encompassing a relatively long period, constituting an important source of information on the subject. On the other hand, if we take into account the evidence of this study and the existing evidence in the literature, we can draw some conclusions that can be useful in defining prevention and control strategies of incidents by foreign bodies in natural orifices of the head and neck.

Keywords: foreign body, otolaryngology, incidence, epidemiology.

Incidência de corpos estranhos em pacientes de hospitais quaternários

Resumo

Corpos estranhos na área de otorrinolaringologia são muito comuns em nossa experiência em países de baixa renda, por várias razões, incluindo a falta de brinquedos apropriados e adequados para crianças. O objetivo deste estudo, foi determinar o perfil epidemiológico e clínico dos pacientes atendidos no Serviço de Otorrinolaringologia com diagnóstico inicial de corpos estranhos entre o período de 2007 a 2011. Este estudo é de caráter descritivo e retrospetivo, que passa por uma recolha e análise dos dados disponíveis em vários livros de registo de pacientes com corpos estranhos consecutivamente num período de 5 anos. Foram estudados 2615 pacientes com corpos estranhos. A maioria dos casos ocorre entre os meses de Agosto a Novembro. No final da semana, observou-se um menor número de casos. A maioria dos pacientes são do sexo masculino. A queixa mais frequente dos doentes com corpos estranhos neste estudo, foi a disfagia. Os metais foram os corpos estranhos mais encontrados, sendo a maioria no esófago. Este estudo apresentou uma compilação que abrange um período relativamente longo, constituindo uma importante fonte de informação sobre o tema. Por outro lado, se tivermos em conta as evidências deste estudo e as evidências existentes na literatura, podemos retirar algumas conclusões que podem ser úteis para definir estratégias de prevenção e controle de incidentes por corpos estranhos em orifícios naturais.

Palavras-chave: corpos estranhos, otorrinolaringologia, incidencia, epidemiologia.

1. Introduction

The foreign object is often found lodged in the head and neck natural orifices such as the ear, nose, throat, and aerodigestive tract and can lead to significant harm and necessitate prompt medical or surgical intervention. (Kekre et al., 2022).

Foreign bodies (FB) in the ENT area are very common, in our experience, in low-income countries, for several

reasons, including lack of appropriate and suitable toys for children and the ingestion of small fish, cheaper, with very small bones that easily become embedded in tissues.

Foreign bodies in otorhinolaryngology can be found in outpatient clinics and emergency departments, affecting children and adults. However, patients are not always aware of the presence of a foreign body and present pain and discomfort as their main complaint (Oyama, 2019) and each foreign body case presents an exceptional challenge that must be dealt with appropriately (Ette, 2006). The physician should be highly suspicious whenever a child comes with an episode of sudden cough followed by dyspnoea, dysphagia, and sialorrea. In adults, there is a definite history of ingestion or accidental entry into the nasal cavity or ear canal (Kekre et al., 2022).

This work aims to determine the epidemiological and clinical profile of patients assisted in the ENT Department, Maputo Central Hospital, Maputo City, Mozambique, with an initial diagnosis of Foreign Bodies (FB), during the period 2007-2011.

2. Materials and Methods

2.1 Type of scientific study

This is a retrospective study, which goes through a collection and analysis of the data available in several registry books of patients with foreign bodies consecutively in 5 years (01/01/2007 to 12/31/2011).

2.2 Data collect

To identify the cases, the records of the ENT office and operating and emergency rooms (ES) were evaluated. Included in the study are patients with ENT FB and excluded from the study Incomplete Clinical Process. Data confidentiality was guaranteed through anonymity, the use of passwords, and access to data only to researchers.

2.3 Ethics and protocol council

The research was conducted by the required ethical standards - Resolutions 466/2012 - 510/2016 - 580/2018, of the Ministry of Health. The study protocol was approved by the National Bioethics Commission in accordance with the Helsinki Declaration on clinical research involving human subjects (128/CNBS/10) of May 6, 2010. Search for several clinical files of cases with FB in the record books and clinical processes. Collection and analysis of the secondary data available in the record books with SPSS-v26. The variables for which data were sought were date, hour, age, sex, symptoms, type of FB, anatomical location, Complaint, extraction attempts, Attempt location, anesthesia, and complication. Every effort was made to minimize Repeated cases.

2.4 Statistical analysis

The results are described in Tables and Graphs and univariate, bivariate, and multivariate analyses were carried out to test some relationships, seeking significance levels of 95% ($p < 0.05$), using the statistical package SPSS version 26.

3. Results

In the study period (2007-2011) the data of 3060 patients with ENT FB were analyzed, excluding 445 with a final sample of 2615 patients. The mean age of the patients is 13.28 years, with male predominance (53.50%). In both genders, there were more cases at age 0-4 years (50.32% and 48.27% respectively) and more cases in the group < 18 years (72.84% and 68.67% respectively) ($p = 0.0192$). About 95% (2479/2615) had a positive history for FB. In 83.25% of the cases, had not been made attempts to remove the FB, while in 16.75% there was this antecedent.

52.74% of the cases, the extraction attempt was made by the patient himself, healthcare personnel 25.80% and in 21.46% some member of the family. In 74.66% of the cases, the extraction attempt was made at the patient's home, and in 20.55% in healthcare. No statistically significant association between school days and < 9 years of age. A relationship between climatological season and patients with FB is statistically significant ($p = 0.0008$), with predominance in the winter (51.77%; 1354/2615) (Table 1).

Table 1. Correlation between the days of the week (weekdays or school and weekends) in the age group of children older or younger than 9 years; Correlation between school months and vacation months in the pediatric and adult age groups and Correlation between the weather stations (winter and summer) and two age groups (younger and older than 9 years).

	0 a 9 years	> 9 years	Total
Weekdays	1295	721	2016
Weekend	409	190	599
	1704	911	2615
OR = 0.83 (IC: 0.68-1.02), X^2 = 3,15 p = 0.075 (95%)			
Scholar months	1321	692	2013
Holliday months	383	219	602
	1704	911	2615
OR = 1.09 (IC: 0.90-1.33), RR = 1.03 (0.96 < RR < 1.10); X^2 = 0.73, p = 0.392 (95%).			
Summer months	863	398	1261
Winter months	841	513	1354
	1704	911	2615
OR = 1.32 (IC: 1.12-1.56), RR = 1.04 < RR < 1.17, X^2 = 11.23, p = 0.0008			

Note: OR = Odds ratio. RR = Relative risk. Source: Authors, 2024.

In the morning, there were more cases attended (41.91%), in both genders, in all age groups, mostly located in the ear and aerodigestive tract ($p < 0.0001$). Attendance at the ENT office was more frequent in the morning (69.13%; 721/1043), while in the ES it was more frequent in the night (40.37%; 602/1491) (Table 2).

Table 2. Distribution of patients by place and time of care in the Maputo Central Hospital (HCM).

Timetable	Place of care			Total
	ES	ENT office	Pediatric emergency	
7-14h	321	721	54	1096
14-20h	568	322	19	909
20-7h	602	0	8	610
Total	1491	1043	81	2615

Note: ES: Emergency Service; Source: Authors, 2024.

Most of the FB were found in the esophagus (42.37%), in the ear (27%), and in the nose (12.08%). In both genders, metals were the most frequent FB (39.30%), followed by fish bones (19.60%) and cotton (13.20%) and the most common locations were the Pharynx, Esophagus, Nose, and Ear (Table 3). Plastic and food FB are more frequent on Friday (17.94%; and 20.08%; respectively).

Table 3. Distribution of patients by day of the week regarding the type of FB.

Weekday	Type of FB						
	Plastic	Metals	Cotton	Seed, stem, leaves and fruits	Fishbones, bones and meat	Another	Total
Monday	38	150	58	43	89	36	414
Tuesday	45	169	56	53	87	38	448
Wednesday	35	157	47	48	66	20	373
Thursday	37	147	55	39	56	33	367
Friday	47	134	58	50	103	22	414
Saturday	36	147	42	27	66	23	341
Sunday	24	125	28	19	46	16	258
Total	262	1029	344	279	513	188	2615

Note: FB = Foreign Bodies. Source: Authors, 2024.

The anatomical location of the FB varies with the type of FB: Plastic (69.85%, Nasal Fossae); Metal (92.71%, esophagus); Cotton (97.09%, Ear); Vegetable (56.63%, Ear) (Table 4)

Table 4. Distribution of patients by anatomical location concerning the type of FB found.

Anatomical location	Type of FB													
	Plastic	Metals	Wood	Glass	Cotton	Seed, stem, leaves and fruits	Animals	Fishbone and bones	Stone	Paper	Sponge	Rubber	Another	Total
Mouth	0	0	0	1	0	1	0	4	0	0	0	0	0	6
Larynx	0	1	0	0	0	2	0	7	0	0	0	0	0	10
Pharynx	4	11	3	8	1	1	1	360	0	0	0	0	2	391
Esophagus	10	954	0	14	0	2	0	126	2	0	0	0	0	1108
Trachea	6	2	0	0	0	4	0	0	0	0	0	0	0	12
Bronchios	8	10	0	0	0	44	0	3	0	0	0	1	0	66
Nasal cavity	183	19	3	0	9	67	1	3	4	10	12	2	3	316
Ear	51	32	31	1	334	158	63	10	7	8	0	6	5	706
Total	262	1029	37	24	344	279	65	513	13	18	12	9	10	2615

Note: FB = Foreign Bodies. Source: Authors, 2024.

Table 5 shows the association between the person who attempted the extraction of the FB and the place where it was performed. It is observed that, in all cases of previous extraction carried out by the patient himself, or by his relatives, it was carried out at home, while most of the attempts by health personnel were carried out in a Healthcare Center (69.23%; 90/113). In more than 48% of the cases, and both genders, most of the patients had not been assisted in a Health Unit.

Table 5. Distribution of the person and place where the FB extraction attempt was made.

Person who make attempt	Place where an attempt was made				Total
	House	Health Unit	Hospital HCM		
Patient	231	0	0	0	231
Relatives	94	0	0	0	94
health personnel	2	90	20	1	113
Total	327	90	20	1	438

Note: HCM =Maputo Central Hospital. Source: Authors, 2024.

We highlight that in 7.51% of the cases of otic FB, the patient did not refer a history. The same happened in 4.11% of nasal FB, being a chance finding in them. On the other hand, in 30.30% of the cases (20/66) of bronchial FB there was suspicion of the presence of FB, referred by parents or their relatives (Table 6).

Table 6. Distribution of the location of the FB concerning a history of having an FB.

FB Location	He refers to a history of FB		Total
	Yes	No	
Mouth	6	0	6
Larynx	9	1	10
Pharynx	385	6	391
Esophago	1101	7	1108
Trachea	2	10	12
Bronchio	20	46	66
Nasal cavity	303	13	316
Ear	653	53	706
Total	2479	136	2615

Note: FB = Foreign Bodies. Source: Authors, 2024.

In 35.72% of the cases, the intervention performed was esophagoscopy and otoscopy with instrumental extraction (15.22%). In 122 of the patients, the FB came out spontaneously (4.67%). In 21 cases (0.8%) an esophagoscopy was performed, but without finding the FB in the esophagus, and in 2 cases (0.08%) the FB progressed to the stomach during the maneuvers performed with the endoscope (Table 7).

Table 7. Distribution of the type of intervention carried out for the extraction of the FB.

The intervention used in the HCM for the extraction of the FB	Frequency	%
Esofagoscopy	934	35.72
Direct Laryngoscopy	9	0.34
Mc Tosch Laringoscopy	361	13.80
Rhinoscopy	316	12.08
Otoscopy + instrumental extraction	398	15.22
Pharyngoscopy	62	2.37
Bronchoscopy	77	2.94
came out spontaneously	122	4.67
Otomicroscopy + instrumental extraction	41	1.57
Ear washing	267	10.21
Negative Esophagoscopy (FB in the low gastrointestinal tract)	21	0.80
FB passed into the stomach during esophagoscopy	2	0.08
Telelaryngoscopy	5	0.19
Total	2615	100.00

Source: Authors, 2024.

In Table 8 we can see that the most frequent interventions were esophagoscopy and rhinoscopy (in 0-4 years), laryngoscopy, and otoscopy with instrumental extraction (> 4 years). Spontaneous exit from the FB occurred especially in the age group 0 to 4 years (66.39%).

Table 8. Distribution, by age groups, of the type of intervention used to extract the FB.

intervention name	Age group (in years)					
	0-4	5-9	10-14	15-19	+19	Total
Esophagoscopy	663	144	24	2	101	934
Directa Laringoscopy	6	0	0	0	3	9
Mc Tosch Laringoscopy	53	29	20	15	244	361
Rinoscopia	270	39	1	1	5	316
Otoscopy + instrumental extraction	64	73	27	23	211	398
Pharyngoscopy	4	0	4	6	48	62
Bronchoscopy	57	18	2	0	0	77
came out spontaneously	81	26	7	1	7	122
Otomicroscopy + instrumental extraction	5	8	7	0	21	41
Ear washing	85	57	18	13	94	267
Negative Esophagoscopy (FB in the low gastrointestinal tract)	18	2	1	0	0	21
FB passed into the stomach during esophagoscopy	2	0	0	0	0	2
Telelaryngoscopy	0	0	1	0	4	5
Total	1308	396	112	61	738	2615

Source: Authors, 2024.

4. Discussion

In the present study, there were more cases in winter, unlike the Spanish study (Lopez Amado et al., 1993). There are fewer cases of FB on weekends because parents are at home and daycare centers are closed. There is some consensus that patients with FB are usually male (Costa et al., 2007). The results of our study do not allow us to establish a relationship between the socio-economic status of the patients, although there is a perception that the most vulnerable population is the one with the most disadvantaged socio-economic situation.

More than half of the patients were assisted in the Emergency, followed by the ENT office. The assistance of patients in the ES is more frequent on weekends since the ENT Office is closed. On Mondays and Tuesdays, more patients were treated in the ENT Consultations, especially on Mondays, which can be related to the patients who were assisted during the weekend in the ES and who were sent for evaluation in the ENT Office this first business day. These differences have been statistically significant in our study ($p < 0.0001$). Most of the patients under 9 years of age were assisted in the ES, while the group of patients between 15-19 years of age was more common in the ENT Office. These differences were also statistically significant ($p < 0.0001$), while there are more cases of men in the ES (58.83%) and women in the ENT Office. These results were also statistically significant ($p = 0.0002$).

In the ES there were more cases of Digestive and Nasal FB, in the ENT office there were ear FB and in Pediatrics there were more cases of airway FB, which is related to the fact that this location is more frequent in children and the ES of Pediatrics they have an Intensive Care Unit. These differences were also statistically significant ($p < 0.0001$). Dysphagia was the symptom most commonly reported by patients (22.83%), followed by Odynophagia (16.10%) and Otalgia (15.68%). Instead, in a study (Silva Neto et al., 2007) Unilateral rhinorrhea had been the most frequent symptom, while in other studies (Morán Poladura et al., 2010) most of the patients did not report any discomfort.

The time of evolution varies depending on the location of the FB and the complaints, < 6 h in the digestive tract and < 24 h in the ear, nose, and airways. In our study, 94.80% reported an incident with FB, while the remaining 5.20% attended for symptoms not related to a history of FB. In these cases, the medical examination related their symptoms to the presence of an FB. It should also be noted that in 9.76% who reported an incident with FB, no object was found.

In the cases of vegetable or cotton-type FB, we have observed a higher frequency of patients who do not report its existence. The presence of cotton in the ear is usually due to the detachment of the swabs used for cleaning the ear, many of them of poor quality, and the patient does not refer to the incident, and this is not related to the patient's gender. Our perception is that many patients skip removal attempts, either by themselves or a family, out of embarrassment or fear of being reprimanded by health personnel. In other studies, reference has been made to previous manipulation, in an attempt to extract the FB by non-health personnel, as is the case in Brazil, where said manipulation ranged from 9.80-58.90% of cases (Tiago et al., 2006; Costa et al., 2007) or in Colombia (Trujillo; Vilamizar, 2008) in which it reached 26% of the cases carried out by the parents or caregivers of the patient.

On Sunday were more attempts by a family member, probably because the Healthcare Centers were closed and parents sought other solutions before going to the hospital. Attempts to extract an FB by non-specialized personnel range from 16-32% (Tiago et al., 2006; Afolabi et al., 2009) with the youngest children being by health and medical personnel. in those over 19 years of age, by the patient himself (74.89%). In a study carried out in Mexico, there were more cases of previous manipulation for the extraction of ear FB by a family doctor, followed by a family member (Almeida et al., 2006).

The majority attempts to remove FB was carried out in their own home, Healthcare Centers, and a hospital. Esophagoscopy was the most common procedure, as in another study (Filócomo et al., 2002). Even though our study has a pediatric predominance and the esophageal and otic location, the need to use general anesthesia for the extraction of the FB has been minimal, in contrast to other studies made by us in 2009 at the same hospital, because most of the otic FB are performed without anesthesia given the implications it represents, both in human and material resources.

In most of our patients, the presence of FB was demonstrated, which justified the initial diagnostic orientation. However, its presence was not demonstrated in 10.21% of the cases. This data is lower than that referred to in another study (Morán Poladura et al., 2010). In all age groups, the confirmation of the presence of FB was greater than 86%, while in patients > 19 years was 79%, probably because in this group there were more cases of sensation of the FB in which its presence was not confirmed. In all anatomical locations, there were more cases with suspicion of having an FB, while it was the Airway where there was no previous diagnosis (64.77%). The confirmation of having an FB varied according to gender, being higher in women (91.20%).

As this is a retrospective study, it presents the limitations associated with this type of research; however, measures were taken to mitigate these limitations. The frequent lack of information in clinical processes, such as the type of complications, prevented the comprehensive analysis of certain pertinent findings in the study of foreign bodies. As a mitigation strategy, we opted not to delve into some variables in-depth. Since this is a hospital-based study, it cannot be extrapolated to the national population. Nevertheless, despite these limitations, we believe that this study constitutes a valuable contribution to addressing this issue, given the extensive data collected from a substantial number of patients over 5 years.

5. Conclusions

This study presents a compilation encompassing a relatively long period, constituting an important source of information on the subject. On the other hand, if we take into account the evidence of this study and the existing evidence in the literature, we can draw some conclusions that can be useful in defining prevention and control strategies of incidents by foreign bodies in natural orifices of the head and neck. Most patients are male, especially between 0-4 years of age. The overwhelming majority have a positive history of foreign bodies and in about 17% there was an attempt to extract them. Most of the foreign bodies were located in the esophagus, ear, and nasal cavities and esophagoscopy was the most affected procedure.

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7. Authors' Contributions

Mahomed Sidique Abdul Cadar Dadá: project design, research, writing and corrections, and submission and publication. *Abdul Habib Mahomed Dadá*: research, writing, and corrections. *Zulaikhah Mahomed Sidique Dadá*: research, writing, and corrections.

8. Conflicts of Interest

No conflicts of interest.

9. Ethics Approval

Yes. The study received the certificate with the number 128/CNBS/10; 3222/DGHCM/11 for work with human beings.

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